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**REMARKS**

Applicants and the undersigned are most grateful for the time and effort accorded the instant application by the Examiner.

Upon entry of the instant Amendment, Claims 1-8, 11-15, and 20 are all of the claims under consideration before the Examiner. Claim 1 is amended. Applicants respectfully submit that no new matter has been added by the present amendments. Support for the amendments can be found generally throughout the Applicants' disclosure. (E.g., Page 8, Line 29 – Page 9, Line 10)

**I. CLAIM REJECTIONS:**

The Office is respectfully requested to reconsider the rejections presented in the outstanding Office Action in light of the following remarks.

**A. 35 U.S.C. 103(a) Rejection over Lange**

Claims 1-8, 11-15, and 20 stand rejected as allegedly being obvious over Lange, USPN 6,548,570. Applicants respectively disagree for the following reasons.

As best understood, Lange relates to a method for manufacturing a radiation shielding material in which "[a] radiation shielding material is manufactured from an elastomer that is blended with a radiation-absorbing filler material. The filler material comprises a powder of a metal with a high atomic number, or compounds thereof. The filler material is represented by more than 80 percent weight and has a grain size distribution in the range of 20  $\mu\text{m}$  to 120  $\mu\text{m}$ . The filler material is mixed with a loading material in powdered form. That mixture is kneaded with the elastomer within a mixer while the temperature is maintained below 180°C. The kneaded mixture is cooled and then cut into strips. The strips are passed through a strainer having a mesh width of between 5  $\mu\text{m}$  and 1000  $\mu\text{m}$ . The strained strips are then formed into a foil." (Abstract)

As the Examiner notes, Lange differs from the Applicants' claimed invention in that there is not a direct teaching of gadolinium(III) oxide use in an amount greater than 26 wt% as presently claimed. However, the Examiner opines that it would have been obvious to one skilled in the art "to use the broad disclosure of the concentration range

for the metal filler material as motivation to actually use gadolinium oxide in an amount of at least 26 wt%..." (Office Action Page 5). In other words, the Office believes an increase in the amount of gadolinium(III) oxide to >20 wt% as set forth in the present Claim 1 is obvious because Lange at Column 3 teaches the use of gadolinium at greater than 20% and in the Examples teaches the use of gadolinium oxide. However, the Examiner's rejection fails to fully consider the reference's teaching to the skilled artisan of the difference between a "filler" and a "loading" material and the use of both materials in the composition of Lange. Lange teaches a composition comprising both a "filler" material and a "loading" material. As concisely stated in the abstract of Lange, "A radiation shielding material is manufactured from an elastomer that is blended with a radiation-absorbing filler material. [T]he filler material is mixed with a loading material in powdered form." (See *also*, Col. 3, Line 1-15 (elastomer); Col. 3, Lines 16-27 (addition of "filler"); and Col. 3, Lines 28-44 (addition of "loading materials")

Consideration of the following will make clear the relation of the above teaching to the present rejections, namely, consideration of the following: a) the teaching by Lange at Column 3; b) the teaching of Lange in the Examples; and c) the combined teachings of Column 3 and the Examples of Lange. In so doing, it will become clear that Lange fails to teach the presently claimed invention at Column 3 or in the Examples and, moreover, via the combination of the same.

In column 3, Lange teaches that the filler material can be gadolinium in an amount greater than 80% and also that the loading material can be various compounds, including barium, in an amount greater than 10%. Amended Claim 1, no longer recites barium and therefore, Column 3 of the reference fails to teach the presently claimed invention. Lange, additionally, teaches in the Examples that the loading material may be gadolinium(III) oxide, but at less than 20%. Thus, again, failing to teach all the elements of the present invention.

According to the Office, however, one skilled in the art would combine Lange's teaching of gadolinium greater than 80% (Column 3) with gadolinium(III) oxide (Examples) to arrive at gadolinium(III) oxide in an amount greater than 80 wt% which overlaps the presently claimed range of element a).

However, such a conclusion ignores the express teaching of Lange of the use of a filler and a loading material. Namely, Lange teaches the "filler" may be greater than 20wt% (E.g. Col. 3), however, the Examples of Lange fail to teach the use gadolinium(III) oxide as a filler, instead the examples expressly teach the use of gadolinium(III) oxide as the loading material. Thus the Office's proposed combination requires the substitution of the filler with the loading material (i.e., gadolinium for gadolinium(III) oxide), which is opposite of the express teaching that both a filler and a loading material are part of the invention and, as such, each material is independent and distinct from the other. Simply, Lange teaches separate and non-substitutable use of gadolinium and gadolinium(III) oxide.

In light of the above, it is respectfully submitted that the reference teaches away from the combination forming the basis of the present rejection and, therefore, the presently claimed invention is not obvious in view of Lange. The rejections can and should be withdrawn at this juncture.

**B. 35 U.S.C. 103(a) over Hall et al.**

Claims 1-8 stand rejected as being allegedly obvious over Hall et al., USPN 3,751,387 (hereinafter "Hall").

As best understood, Hall relates to "[a] composition adapted for producing a self-supporting structure or nuclear radiation shield, which composition comprises a mixture of a solid material and sucrose or the like, along with a solvent for the sucrose or its substitute, whereby a self-supporting structure can be set by removal of the solvent from the saturated solution of the solute." (Col. 2, Lines 26-32) Set forth in Table I of Hall are various neutron absorbing compositions. While the present invention is not expressly taught by Hall, the Office opines that it would have been obvious to combine the materials of Table I to arrive at the present invention since they serve a similar purpose, unless some surprising or unexpected result is demonstrated by the presently claimed composition.

Applicants generally maintain their disagreement with the finding that the disclosure of Hall would render the presently claimed composition *prima facie* obvious;

however, Applicants have now conducted further experimental testing which demonstrate unexpected and superior results. The results and summary of the experiments are provided in the Declaration under 37 CFR 1.132, which is submitted simultaneously with this paper. In addition, a graph of the results is attached hereto and to the declaration.

As best understood, Hall appears to teach the use of the following compounds individually: gadolinium(III) oxide (57 wt %), tungsten (69 wt% and 66 wt%), gadolinium (58 wt%), and Tin (69 wt%), *inter alia*. The radiation attenuation (x-ray transmitted) vs. the bulk covering is plotted in the attached graph for the following compounds: a) lead, b) tungsten, c) a composition not in accordance with the present invention comprising only gadolinium(III) oxide (Example 50), d) a composition not in accordance with the present invention comprising gadolinium(III) oxide 75%, tungsten 5%, and tin oxide 20% (Example 51), and e) a composition in accord with the present invention, namely, Example 8 as set forth in the Applicants' disclosure, comprising gadolinium(III) oxide 44.4% and Tungsten 27.3%.

As shown in the graph, the mixture in accordance with the present invention is clearly superior to all of the other compositions compared above. Therefore, one skilled in the art would not have found it obvious to simply pick and choose combinations of compounds from Table 1 of Hall to arrive at the presently claimed invention. In light of the demonstrated superior and unexpected results, Applicants respectfully request the withdrawal of the present rejections.

## **II. CONCLUSION:**

In view of the foregoing, it is respectfully submitted that independent Claim 1 is fully distinguishable over the applied art and is thus in condition for allowance. By virtue of dependence from what is believed to be an allowable independent Claim 1, it is respectfully submitted that the remaining claims are also presently allowable. The claims presently withdrawn contain all the limitations of the claim in condition for allowance and therefore should be rejoined and allowed as well. Notice to the effect is

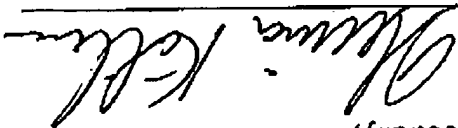
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Respectfully,  
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earnestly solicited. If there are any further issues in this application, the Examiner is invited to contact the undersigned at the telephone number listed below.

The USPTO is hereby authorized to charge any fees, including any fees for an extension of time or those under 37 CFR 1.16 or 1.17, which may be required by this paper, and/or to credit any overpayments to Deposit Account No. 50-2527.

## APPENDIX A